10/005,293

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PAGE 1/7 * RCVD AT 12/15/2003 3:33:54 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/7 * DNIS:8729326 * CSID:(312)-759-5646 * DURATION (mm-ss):02-42

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EXAMINER: Theodore M. Blum

GROUP ART UNIT: 3662

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December 15, 2003

920536-905573

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE THE APPLICATION OF:

David Bevan et al.

Serial No: 10/005,297

Filed: December 5, 2001

FOR: Position Location Method And Apparatus For A Mobile Telecommunications System

Examiner: Theodore M. Blum

Group Art Unit: 3662

Customer number: 23644

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RESPONSE TO OFFICE ACTION OF SEPTEMBER 15, 2003

Honorable Director of Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This paper is being filed in response to the examiner's office action of September 15, 2003. No amendments are being made since it is submitted that, upon reconsideration, no amendments are appropriate.

In the Office Action, the Examiner rejects all of the claims pending in the application, namely claims 13-20 and 29-35, under 35 U.S.C. §102 on the basis of newly cited US 5977913 (Christ). Specifically, the Examiner objects that the methods and structures defined in all of these claims are anticipated by Christ. Reconsideration is requested.

It is submitted that this rejection is not well-founded. Each of the independent claims in the application relates to a method or an apparatus for calibrating a direction-finding antenna in a radio telecommunications system. Christ describes a system comprising numerous antennas, but none of these are direction-finding antennas and they do not form part of a telecommunications system. Christ cannot therefore anticipate or be relevant to the novelty of any of the claims in the present application.

The apparatus described by Christ comprises a number of sensors strategically disposed throughout a building or area, each for sensing the signal strength of a received radio signal. All of the sensors are coupled to a central processor. When a radio transmission is made within the building or area being monitored, the processor receives respective signal strength levels from each sensor and uses these signal strengths and the known locations of the sensors to assess the location of the radio transmission within the monitored building or area. The location assessment is made by comparing the signal strength levels with a calibration table or by calculating the radio transmission location on the basis of an interpolation method. These aspects of the system are outlined perhaps most clearly in the Abstract and in columns 9 and 10 of Christ.

The "Background of the Invention" set out by Christ discusses a variety of different position-location systems using radio transmissions and eliminates all of these as being unsuitable for various reasons, except for the system of signal strength measurement at a plurality of known locations described above. The present application relates to the use of multi-element direction-finding antenna arrays and various Doppler array techniques. Christ mentions such techniques at column 1 lines 32-37, stating that "direction-finding.....using directional antennas or pseudo-Doppler array techniques...(was) developed for outdoor use over relatively long ranges" and that "the reliability and accuracy of these systems falls short of required personnel tracking needs". The present application relates specifically to the use of these techniques for "outdoor use over relatively long ranges" (for mobile telephone systems) and is directed to improving the reliability and accuracy of such systems. It is clear from Christ's comments in his patent application that his techniques would be of no value for improving such systems. He does

describe various calibration arrangements for his own personnel-tracking system but it is submitted that an inventor seeking to improve the reliability and accuracy of direction finding using directional antennas would be taught nothing useful by the disclosure in Christ's patent application. In addition, Christ effectively states in his comments regarding directional antennas mentioned above, that his teaching can be of no relevance to the inventor working in the field of directional antennas. The present invention is therefore incompatible with Christ's teaching.

Turning to the claims in the present application, it is important to appreciate that these do not define or seek to protect the general concept of calibration in radio systems. The claims seek only to protect certain specific and advantageous implementations for calibrating a specific type of radio system.

This type of radio system is a radio telecommunications system, as specified in each independent claim. Christ does not describe a radio telecommunications system but only a personnel-location system.

Each independent claim specifies a method or apparatus for calibrating a direction-finding antenna. The application describes various sources of error in such direction-finding equipment, and lists by way of example on page 33 "differential phase errors in filters", "phase errors at array caused by adverse weather conditions (e.g. snow build-up on radome)", "incorrect alignment of antenna arrays" and "antenna tower twisting, due to the effect of wind, temperature cycling, etc". It is particularly notable that none of these sources of error could occur in the personnel-location system of Christ, specifically because Christ uses sensors which detect only signal strength not direction. Thus, Christ's calibration methods do not address any errors of these types.

Independent claims 13 and 29 relate to a method and an apparatus involving transmitting signals from a near-field calibration source comprising a radio transmitter. As described in the present application, this is useful for calibrating out phase errors due to weathering or ageing, and can address errors in both an antenna array and the associated receiver circuitry. A near-field

source would be of no value for calibrating Christ's personnel-location system. In Christ, calibration sources must be positioned at different locations around the building or area being monitored, at a distance from Christ's sensors.

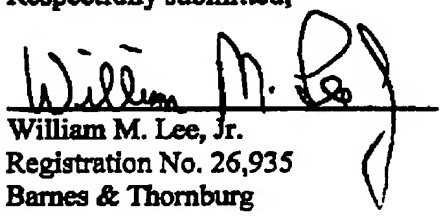
Independent claims 14 and 30 define a method and an apparatus for calibration using a radio transceiver beacon, having at least partial transmission and reception functionality of a mobile telecommunications station (a mobile handset). Such a beacon is positioned at a predetermined, known position so that a call can be set up from a base station of a mobile telecommunications system, which can then use the known position of the beacon for calibration purposes. This arrangement is incompatible with Christ, in which the sensors have no transmission capability and cannot "set up a call" to a calibration beacon. In more general terms, this is because Christ does not relate to a telecommunications system at all, but only a system of passive sensors.

Finally, independent claims 17 and 33 define a method and an apparatus in which a transmitter beacon for calibration purposes is situated at a second cellular radio cell site adjacent to a first cell site. The beacon can then be used for calibrating the direction-finding antenna and receiver circuitry at the first cell site. Again, such an arrangement is incompatible because in Christ, no cell sites exist at all. A significant advantage of the claimed invention is that, when calibrating direction-finding antennas, it is important to avoid mulitpath signal transmission, and cell sites tend to be positioned at prominent locations, such as on antenna masts or high buildings, which reduces the risk of mulitpath propagation.

In view f these comments it is respectfully submitted that the present application is in condition for allowance and should be able to proceed to issue.

December 15, 2003

Respectfully submitted,



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